COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Students Meet Computer

A group of 7 to 11 year old children get a briefing on computers from Earl Ubell, WCBS-TV science news editor. The children appeared on "Around the Corner," a weekly program sponsored by the New York City Board of Education. The computer, a Digital Equipment Corp. PDP-8/S, is used by high schools and colleges.

IBM Revises BOS, DOS, TOS

WHITE PLAINS, N.Y. – New optical character reading and data communications capabilities are featured in the latest versions of operating systems now available for IBM Systems/360 users. Announced by IBM were release 15 of Disk Operating System/360 and Basic Operating System/360, and release 10 of Tape Operating System/360.

The improved operating systems now include:

- Support of the IBM 1287 optical reader for handling both machine and hand printed numeric data and optical mark-read data from cut form documents.
- The capability for the IBM 1285 and 1287 optical readers to handle blocks of input data printed on cash register and adding machine tapes.
- Support of DOS/360 BTAM (Basic Tele-processing Access Method) for the IBM 2780 data transmission terminal. BTAM provides control functions and input/output macroinstructions for telecommunications applications programming.
- Provision for transmission of Extended Binary Coded Decimal Interchange Code and America Standard Code for Information Interchange under BOS/360 by means of binary synchronous communications. This capability eliminates the need for code translation, thus conserving core, simplifying programming, and increasing overall system efficiency.
- Additional input/output commands for display control units driving IBM 2260 Model 2 display stations, under DOS/360 BTAM. The commands cause the addressed keyboard on the display to retain the same locked or unlocked status that existed at the start of the operation. The keyboard can be restored either by program control or by operator depression of the Erase Display or the Restore key.

Journal Warns of Dishonest 'Computer Operators'

Last week the **Wall Street Journal** stated that "crooked operators use computers to embezzle money from companies." For the three cases cited, however, only one "operator" was indeed a computer operator, COMPUTERWORLD was told by the companies involved.

It was reported that a former vice president of Walston & Co., a New York brokerage firm, electronically embezzled $250,000 from the company between 1951 and 1959. The story, an old one, has been reported in the press several times before. Equipment used for this grand scheme was electronic only to the extent that a punched card accounting machine runs on electricity.

Sundays at the Office

The embezzler did not really have to know much about things electronic to slip into the office early on Sunday morning to punch a few new cards that would transfer money to two customer accounts – those, of course, being his own and his wife's. The only edge the embezzler had was in the use of an impersonal punched card, rather than a typewritten transfer record that would probably have required a signature. As far as computers are concerned, J. O'Halloran, a Walston & Co. assistant vice president, told COMPUTERWORLD that they installed their first computer in November 1961 (an IBM 7070) two years after the embezzler had been found out.

Post Office Saves the Day

The second embezzler had a somewhat shorter and less lucrative career at another New York brokerage office, Carlisle & Jacquelin. Again, through the use of punched cards, the thief managed to have checks written to bogus names at his address.

His $18,120 venture ended when the post office returned a check to the firm as "addressee unknown" in 1963. B.C. White, an executive assistant at Carlisle & Jacquelin, told COMPUTERWORLD that their first computer was installed in May 1963 and was not in any way involved in the thefts.

On To the Real Thing

In 1965 the National City Bank of Minneapolis installed a computerized check handling system. In addition to the programmer's salary, the bank paid him a $1357 bonus – without their knowledge. He had cleverly programmed the computer to ignore any and all overdrafts on his personal account.

The **Wall Street Journal** said that computerized embezzling can become a regular part of the American way of life and that even skilled computer auditors can "be deceived because so much of what goes on inside the machine never appears on a computer print out."

Computer Aids Bill Collectors Trace Debtors on Move

MINNEAPOLIS – The fight for privacy may have suffered another setback with the announcement that 2500 independent bill collection agencies can now exchange information via a computer system.

The agencies, members of the American Collectors Association, Inc., are reported to have served more than 900,000 credit grantors last year and to have made $470 million in collections. About 24% of the accounts listed for collection involved people who had moved without telling credit grantors.

The association's new system, a GE-405 installed by Tri-Data, Inc., a computer consulting firm and service bureau, will be used for a wide variety of services applicable to the credit and collection industry.

Bureaus to Report

The announcement comes at a time when Rep. Cornelius E. Gallagher (D-N.J.), head of the House Special Subcommittee on the Invasion of Privacy, has already expressed concern about the way credit information may be used. Gallagher has advised credit bureaus to study ways of self-policing client information and to report back to him in four months.

Gallagher's action followed the appearance of credit companies before the committee. One firm said that the Internal Revenue Service had tried three times in recent months to force the firm to divulge information. And IRS has admitted it subscribes to several credit services.

Joint Conference Opens April 29 in Atlantic City

ATLANTIC CITY – Discussions of commercial time sharing, multi-programming operating systems, and separate pricing of hardware and software will highlight the Spring Joint Computer Conference here this month.

Keynote speaker for the conference April 29 to May 2 will be H.I. Rommes, board chairman of AT&T, who will discuss computers and communications. Interest in speaker and topic is underlined by the FCC inquiry into whether common carriers should be permitted to supply data processing services.

During the conference, the annual W.W. McDowall Award will be presented by the IEEE to Seymour R. Cray, research and development vice president of Control Data, for his continuing technical contributions to computer development.

Among topics to be discussed at others of the 21 conference sessions are hardware-software tradeoffs, computer aided design, scientific [illegible]ations, system debugging, com[illegible]nications systems, hybrid comp[illegible]r techniques, and commercial data processing. Other sessions will cover time sharing, magnetic memory design, use of mass storage, switching theory, languages, digital simulation, and fault diagnosis.

Two sessions of general interest will be discussions of "what's wrong with the computing field" and of the frontiers of computers in society.

More than 135 firms will have exhibits at Convention Hall during the actual three days of the conference. Activities April 29 will be limited to registration and a preconference cocktail party at the Holiday Inn.

Jerome B. Wiener, Mandate Systems, will chair the session on second generation commercial time sharing. The four subtopics will be time sharing versus batch processing, computer scheduling methods and their countermeasurers, some ways of providing communications facilities for time sharing computing, and the Baylor Medical School teleprocessing system.

The panel discussion on whether there should be separate pricing for hardware and software will be chaired by Robert B. Forest, Datamation. In theory, separate selling would allow a user to tailor a system from the best of available components. But the result could be a nightmare of confusion since software is always fitted to a specific system.

Multiprogramming

The session on multiprogramming operating systems, chaired by Ascher Opler, IBM, will cover, as one of four topics, the Burroughs B6500/B7500 stack mechanism. E.A. Hauck and B.A. Dent of Burroughs will explain how a close integration of software and hardware disciplines has enabled the company to develop a machine organization addressed to the solution of problems inherent in multiprogramming, multiprocessing, and time sharing.

Additional information on the conference may be obtained by contacting the sponsoring organization, the American Federation of Information Processing Societies, 345 East 47th St., New York, N.Y. 10017.

Computer Stock Prices Up 9%

Stock prices continued to rise in the second week following President Johnson's announcement that he had ordered a reduction in the bombing of North Vietnam, and that he would not seek re-election. Friday, April 5, saw prices decline somewhat following the assassination of civil rights leader Martin Luther King, Jr, the previous night. CW's Computer Stock Composite Index rose 9.4% during the week, compared with an increase of 3.0% in the Dow Jones industrial average, which stood at 866 on Friday's close.

Twenty-nine of the stocks in CW's table registered gains of 10% or more and 53 of the 82 stocks gained 5% or more. Comparatively, only 2 stocks lost more than 5% and none lost more than 10%.

(continued on page 7)

Editorials

Do The Facts Matter?

On page one this week we report on the Wall Street Journal article which was headed in rather sensational terms: "Crooked operators use computers to embezzle money from companies," "Programming a $250,000 theft." Then it went into specific details on what the $250,000 theft had been, where it occurred, and so forth.

Unfortunately, when COMPUTERWORLD checked into the item, it was discovered that during the period the theft had been going on there had been no computer at the firm concerned. In a second instance, where the data processing manager was involved, again there wasn't a computer present. Only in one of the three instances, and in the most minor one, was a computer actually involved.

What had basically happened was that the glamour of the computers had made them the scapegoat for failures in ordinary accounting. Now, of course, there are many senior company officers who have read the article and have started looking at the operators and data processing managers a bit more critically. An unfortunate incident, but a revealing one. One of the crosses we must carry is that the computer must be prepared to play the part of scapegoat even where it is not justified.

Reach Out!

To cut the number of visits a patient has to make to a hospital in order to be cured of a disease is something medical workers give their professional lives for. The whole drug industry aims at this type of operation and is extremely proud when it manages to do so. It is not the type of operation you would expect a computer to do, but a computer is trying to do just that! By organizing schedules efficiently it can immediately have almost the same effect that doctors spend years trying to achieve. *This is important.*

It is important not so much because of the operation itself but because of the characteristics of its success. A computer application of this nature was, of course, not anticipated by the people who were designing the computer. But, the opportunity was recognized by the people who wanted to use it.

Reach out for the new applications! Herein lies the computer's value, and your opportunity!

COMPUTERWORLD

The Newsweekly for the Computer Community

TM Reg. U.S. Pat. Off.

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Measure for Measure

Meaningful, Meaningless, or Misleading?

By Alan Taylor

IBM recently announced their new System/360 system, the Model 85. Certain claims were made about its performance. There are, however, difficulties in evaluating these claims because of their form. The two most prominent ones, for instance, were that it "could execute instructions at a maximum rate of 12,500,000 per second" and that it would "operate at up to three times the speed of the 360/75." Almost equally difficult to interpret was the very important claim about the usefulness of the main innovation, the 16K 80 nanosecond buffer. The claim read: "The program will find the operands in the buffer 95% of the time." No qualifications were given.

IBM spokesmen tried to help by explaining some of these claims. The 12,500,000 instructions per second rate, they said, "was simply the buffer rate." Their arithmetic was correct, but to achieve this rate an instruction would have to be completed every single buffer cycle. Asked about the 95% "find" rate for operands, the answer was, "We are underplaying it. The actual figure is nearly 97%, and sometimes it's 99%."

Testing the Claims

Considering the problems, COMPUTERWORLD decided that the claims were an appropriate item for consideration in this column. "Measure for Measure" as its name implies (at least to those who have become used to the phrase) is a column with a strictly limited function. Its function is to take a measurement, such as a claim that a compiler works five times faster than someone else's compiler, and to check out the basis for the claim. It does not go into a detailed evaluation, but simply presents how the claim has been calculated, and what it means. No more and no less. In the past it has considered a number of claims for hardware and software. The speed advantages of a proprietary software package were examined, claims for one of the non-IBM giant computers were checked, and claimed reduction in programming effort through a different technique was inspected. All were then reported on.

In general, the reports were favorable. The claims had valid documentation and proper calculations supporting them. However, in at least one case we severely upset the owners of the package concerned. They felt that their package was up to the claims – maybe it was. But the documentation did not prove it, so that the "measure" that they were offering to the public was not itself able to "measure" up to any reasonable standard.

In one case we had faced a claim posed in terms outwardly similar to those used by IBM to describe the 360/85. Computer Sciences claimed that their Cogent system "would reduce the programming task by up to 75%." Our investigation showed that it had been known to reduce it 95% and that 75% was a good average. This struck us as just what a user would understand when he read the claim, so we actually singled out the phrase and noted how it had been appropriately used there.

The technique was, as it has been with the 360/85, to find out the facts on which the claims were based and to see if they tallied with what someone reading the claims and applying them to his own case would reasonably expect.

What The 360/85 Is

The IBM 360/85 is a new computer, fully System/360 compatible, and is intended primarily as a growth system for users of the Models 65 and 75. It is designed for high performance across the entire spectrum of editing, file maintenance, and computational workloads.

What IBM Is Saying About The 360/85

The following claims about the performance of the 360/85 have been published by IBM:
(1) "The most powerful computer now offered by IBM, the Model 85 can process data up to three times faster than the Model 75, the most powerful System/360."
(2) "Its CPU can carry out instructions at a maximum rate of 12,500,000 a second."
(3) "The CPU will find the required data within the buffer memory 95% of the time."

What Do They Mean?

However, in the case of the 360/85 claims, we had to extend the method of evaluation. We realized that we might find that the claims, while accurate, were meaningless. After all, on some readings the claim that "machine A can operate at speeds up to 3 times those of machine Y," and the opposite claim that "machine Y can operate at speeds up to 3 times those of machine X" need not be inaccurate. All that is necessary is that each machine have at least one instruction which is three times faster than the compared machine. Then both claims could be proved – but neither would help a user evaluate the machines at all.

Then again the claims might be accurate but misleading. The claim that "machine X can operate at a maximum speed of Y instructions per second" might be true – if all the instructions were "No Ops" and if all the peripherals were down. But, if in normal operation the actual speed was only a small fraction of Y, then the claim could be misleading.

For this evaluation, therefore, COMPUTERWORLD decided to check out the facts used to support the claims, and to find out specifically if they were Meaningful, Meaningless, or Misleading, as well as whether they were narrowly accurate.

In the course of the investigation there were quite a few surprises, such as when we discovered how critical it was that 95% of the operands be in the buffer as claimed (if the figure drops to 90%, performance drops not by 5% – but by something more like TEN TIMES THAT!) and when we realized the weird difference between the Model 85 load instructions and store instructions. These are normally just complementary – but not on the Model 85.

For details of the investigation, read next week's COMPUTERWORLD!

Letters to the Editor

Information Sought

To the Editor:

In the March 6, 1968 issue of COMPUTERWORLD, which I find interesting and stimulating reading each week, there was an article on Page 3, captioned, "100% Conversion of 1400 to 360 Claimed."

I would like to correspond with the company referenced, Convert-A-Code; however, the only address given was Baltimore, Maryland. Could you please give me their full address as I would like to contact them and learn more about their computer converter program.

George J. McDermott
Southampton, Penna.

The address is 303 East Fayette St., Baltimore, Md. Ed.

A Bit of Confusion

To the Editor:

Congratulations on the growth and quality of your newspaper! In particular, I appreciated the success with which Patricia Nesbitt, in her item in the March 20 issue, captured the spirit of the Share Session concerning the proposed Share/Guide merger.

I am also gratified at the accuracy with which she quoted me in my comments in that session. Unfortunately, she was probably justifiably confused when she identified me as being from North American Aviation. The confusion undoubtedly arose when, in accordance with ancient Share tradition, I identified myself by my installation code, i.e., "Frank Wagner, XNA". (The installation code, "ex-NA," was a pun, created when the code was assigned to me as an honorary member after I left NA.)

I am now a senior vice president and a director of Informatics Inc., and president of their subsidiary, Atar Computer Systems, Inc. Perhaps you could do a courtesy to a charter (I think) subscriber and run a minute correction to that effect soon.

I find your paper possibly the most useful one that I receive. I would like to offer a modest suggestion to conserve a few more moments of my time in reading it. An ideal format for the EDP people department would be to have the person's name in one column, his company in another, and the information in a third. Although this would waste two columns of space, the interested reader could scan the columns for persons and/or companies that he was interested in much more rapidly.

Keep up the outstanding work.

Frank Wagner
Vice President
Informatics Inc.
Sherman Oaks, Calif.

Suzanne Flaherty checks tape for Honeywell's new H632 computer

H632 Is Introduced, First in New Series

NEW YORK – Honeywell Inc.'s Computer Control Division has introduced the H632 computer as the first of the new Honeywell Series 32 line of computing systems expected to serve a $215 million market. Larger and smaller computers will be added later.

Prices will range from $100,000 to $1 million, according to Benjamin Kessel, division vice president and general manager. Deliveries will begin this fall.

General Purpose System

The H632 is a third generation general purpose computer system designed for aerospace, military, and process control systems, medical electronics and communications systems, and scientific research. Typical applications were said to include flight simulation and radar control systems, hospital patient monitoring, and control of small industrial computers at distant locations.

"The new line extends Honeywell's capabilities in the computer industry by adding larger control and scientific systems to the company's existing lines of small control and scientific systems and small-to-large business data processors," Kessel said.

Time Sharing Later

Later series will take Honeywell's 32 systems into time-shared applications. In addition, Series 32 will serve existing markets for real time control and off-line scientific uses.

Kessel said the H632 is a 32-bit machine with full cycle time 0.85 milliseconds. It is the fifth third generation computer produced by the division.

The H632 is a multiprocessor system with capacity for up to four central processors and four input-output processors. The basic machine consists of one central processor and one input-output processor. Standard memory capacity is 8192 words, expandable to 131,072.

Standard software includes an assembler, Fortran IV compiler, basic operating system, math library, loader, media conversion programs, and test and maintenance routines.

Peripheral options include magnetic tape units, card reader, card punch, high speed paper tape reader and punch, line printer, and disk units.

The project manager, Roger Ueltzer told COMPUTERWORLD that the multiprocess controller (MPC) coordinates all processor activities within the H632 system. Control of the eight CP program levels and channel activities is accomplished through orders issued to the MPC. An external interrupt may also be used to initiate or modify CP activity. Simultaneous requests for program execution are resolved by the MPC.

Canning Most Often Named Candidate for ACM Presidency

By a Special Correspondent

This is the second in a series of articles on the upcoming ACM elections.

If the ACM elections were tomorrow, and if voters had to write in the name of their choice instead of checking a name on a preprinted ballot, an awful lot of blank ballots would be turned in. Interviews with members, ex-members, and non-members revealed an almost uniform lack of knowledge of candidates and issues.

Of those who knew the names of one or the other of the candidates, the name of insurgent Richard Canning was brought up most often. Canning seems to be the hope of the liberals, possibly mostly because he is bucking the tradition that says vice president Dr Bernard Galler is automatically in line for the presidency.

One issue that stirs up interest is any question of raising the dues, now $25 a year. Both candidates say that they would oppose any such rise, but people remain concerned. Leighton Bloom, president of a new time sharing organization and an ACM member, said that he thought that an increase in dues might result in many people refusing to renew their memberships.

Bill Halpin, manager of Computer Usage Development Corporation's Montclair, N.J. office, took the middle of the road. He said a dues increase might be justified if the proceeds were used to broaden the scope of ACM activities. Halpin, a member until about 18 months ago, dropped out because he felt that being a member wasn't of much value in relation to his work. He said he would consider rejoining if some redirection were in process.

Kathy Weston, an applications analyst at Data Network Corp., New York, is not a member and, in fact, had never heard of the ACM. But on hearing that the dues were already $25, she said she thought an increase would be ridiculous.

On the question of collaborating with other societies, Bloom said this should be on an individual basis. Instead of the societies working together, he thought that people should join one or more groups according to their interests. He noted that societies usually do not have common goals.

Halpin said ACM should not have close ties with manufacturers and was opposed to a tie-in with Share. But he felt that collaboration with other societies might be a way to get ACM closer to the non-academic computer user.

Miss Weston also favored collaboration but wanted the academic atmosphere of ACM maintained. Bloom, without expressing preference, said he thought the academic image would persist simply because the internal academic forces were stronger. Halpin thought the ACM Journal was too technical, that it might be of value to people working on sophisticated software concepts, but not to those involved in everyday business applications.

All three were opposed to ACM taking a stand in Washington. Bloom said there could be no guarantee that the organization would represent the views of individual members. Halpin was opposed because he didn't know what stand ACM would take. Miss Weston simply opposed the idea.

ITT to Expand Fast

NEW YORK – ITT Data Services will expand its commercial data processing operations by establishing additional service centers in more than 20 major cities over the next two years. The new centers will be linked by high and low speed data transmission lines to the division's existing computer facilities in Boston, Los Angeles, and New York.

Service Bureau Contracts Surveyed by ADAPSO

NEW YORK – The first survey of contractual relationships between data processing service bureaus and their clients is being made by the Association of Data Processing Service Organizations (ADAPSO). The survey will cover all member firms of ADAPSO and will review contracts between bureaus and their employees as well as contracts between firms and clients.

ADAPSO executive vice president Jerome L. Dreyer said the survey is designed to review present practices and to make general recommendations regarding agreements between firms and their clients for data processing, systems, and programming services, and for the sale or lease of package programs.

The survey is being conducted by ADAPSO's Contractual Analysis Committee chaired by Robert J. Atkins of Fisher-Stevens, Inc. Thomas H. Schoen, Coastal Data Processing, is vice chairman.

Schoen said the results of the survey will be compiled in May and presented in June. He said ADAPSO is trying to find out how many service bureaus have contracts with clients or employees, and he notes that ADAPSO feels that contracts spelling out the exact nature of the services to be performed and the cost of the service are desirable for the protection of both parties.

New Firm to Specialize in Industrial Automation

STAMFORD, CONN. – A $10 million industrial systems company, Dynamation Systems Inc., has been formed to create and manufacture automation systems for industry.

Dynamation's parent companies are Electric Bond and Share Company and Automation Engineering Laboratory Inc. of Stamford. Each has committed $5 million to the new venture, according to H. Frederick Johnston, Dynamation executive vice president.

Johnston said the firm wasn't ready yet to discuss its plans in detail. But Dynamation will design and manufacture hardware and software tailored for individual industries, particularly those which are still using manual production techniques, he said.

Richard S. White, president of Automation Engineering, will also serve as president of Dynamation. Automation Engineering develops, manufactures and installs automation systems.

BSC Markets Disk Packs With 1 Year Warranty

New Disk Pack from Business Supplies Corporation

NEW YORK – A new disk pack that carries a full year warranty instead of the more common 90 day warranty is being introduced by Business Supplies Corp. of America (BSC).

The Micro-Tolerance Disk Pack sells for the standard price of $490 and is compatible with the IBM 1311 and 2311 disk drives and with drives sold by other manufacturers, a BSC spokesman said.

Deliveries are scheduled to begin this month and BSC expects to be able to make 30 day delivery, faster than IBM but slower than the announced delivery schedule of some of the other independents.

The disk pack, the first to be marketed by BSC, can be ordered through any of the firm's 65 offices.

"We expect that our national coverage of data processing users will enable us to reach a substantial part of the market in a relatively short time," a BSC spokesman said.

"The pack is a superior product, competitively priced and available in quantities," he said.

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Inventor, Computer Design Arched Roof

NEWTOWN, CONN. – An idea for a new invention was fed into a computer and the computer told the inventor not only how to design the invention to make it practical, but also how to design special equipment needed to construct the invention. The idea was to construct a new type of arched roof by putting adhesive plastic between thin metal sheets. Arched roofs are suitable for schools, stores, and other structures needing a large roof without beam support.

After coming up with this new idea, inventor Rowland Brandwein used a computer terminal in his own office to test his theory. The computer language used, Quicktran, is considered ideal for scientific and engineering calculations. Brandwein fed problems into the computer and got answers back on his terminal in seconds. The computer worked out basic methods for constructing such an arched roof and designed special gear which contractors would need for the construction job. In addition, the computer printed out instructions for the contractors.

Plastic Insulation

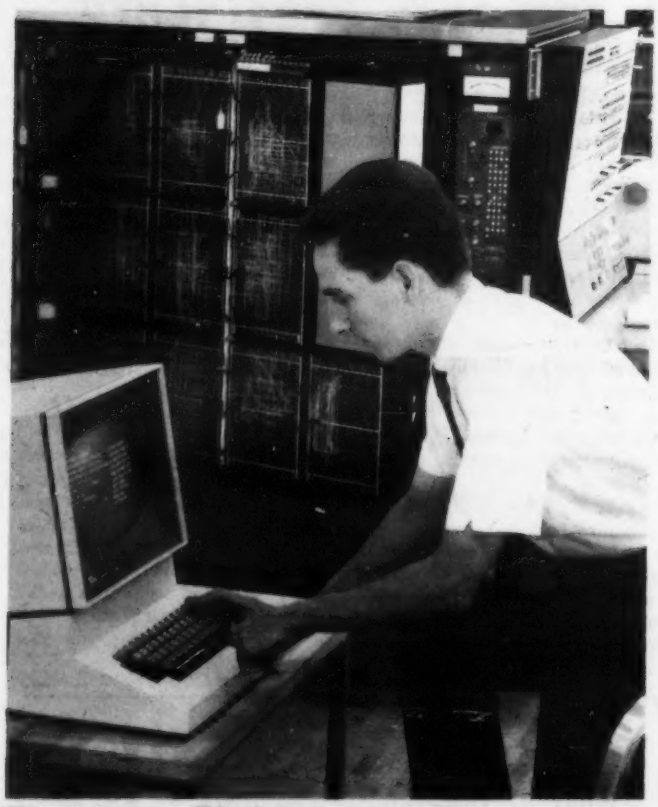
Brandwein's office terminal here is linked to an IBM center in New York, 80 miles away. A computer there serves Span Arch Structures Inc., of which Brandwein is research director, and various other remotely located customers.

To put up the roof, hollow arches are first interlocked. Then urethane plastic is injected into the empty spaces. The urethane hardens in 15 seconds, bonds with the metal, and insulates the roof. The new roof is stated to be long lasting and lightweight.

While its inventor, Rowland Brandwein, looks on, three husky men test the load bearing ability of a new lightweight arch. Brandwein designed his metal and plastic arched roof with the aid of a communications terminal in his office linked to a computer 80 miles away.

COMPUTERWORLD **applications**

Central Computer Helps Technicians Check Out New Computers



IBM technician uses a CRT to help test a computer. Thirty-two such terminals link a central computer to test cells which occupy a quarter mile of floor space at the IBM plant in Poughkeepsie, N.Y.

POUGHKEEPSIE, N.Y. – Computer technicians at a plant here check a computer before it is shipped to the buyer by using another computer to do the testing. A checklist that takes all of a computer's features into consideration is one of the things provided by the system.

Time needed to finish all tests and time left until shipping are checked by the system. This comparison is possible because each of the test routines is timed and the target date for shipment is entered into the test system before a computer reaches the final test stage. In this way a technician can tell if he is on or off schedule. Exact status of a machine can be found out from the central computer at any time.

System Keeps Records

Besides efficient testing, a computerized system provides work records of test personnel and a historical record of tests and adjustments on each machine. Management can keep closer control over inventory if it uses the system, according to reports. Highly precise cost data can be obtained because differences between the same basic models are taken into account by the testing system. And precise scheduling makes fast inventory turnover possible, at least in theory.

The most valuable tool for computer test technicians in the IBM plant here is an information system of 32 television monitor style terminals that link a centrally located computer to test cells. The central computer is a System/360, Model 40, which was produced in the same plant. The test cells take up almost a quarter of a mile of manufacturing floor space. The complete system is called STMIS, for Systems Test Manufacturing Information System.

Life Tests for Army Equipment Designed by Computer Program

FORT HUACHUCA, ARIZ. – The unexpected failure of Army electronic equipment could cost lives, but how can you be sure the equipment has been properly tested before release for field use?

The Army Electronic Proving Ground here has an answer – a computer program that produces reliability test plans. Using input information about the equipment to be tested, the Sequential Test Plan Generator uses Monte Carlo methods to generate a table which sets time limits for acceptance or rejection based on varying numbers of failures.

The program was developed by the Arizona office of the URS Corp. of San Mateo, Calif.

Tax Returns are a Big Job for IRS Computers

WASHINGTON, D.C. – If you think your federal income tax is a headache, think of the problems it and the estimated 108,999,999 other returns due this year are creating for the Internal Revenue Service's computer system.

Last year, the year complete computer checking of forms was initiated, the IRS system handled 105 million returns representing $148 billion in taxes. This year IRS expects to process 109 million returns representing $155 billion in taxes.

Returns are first checked by one of 24 regional computers and then forwarded to the National Computer Center in Martinsburg, W. Va., where they are matched against master files which include a record for every tax paying entity in the country.

Computer Matches Colors, Chooses Dyes by Price

CHARLOTTE, N.C. – Worried by recent dye price increases, a textile manufacturer has programmed his computer not only to generate color formulas but to choose for the formula dyes with prices that have not fluctuated. This helps him to hold his costs down.

Faced with some 11 million colors and several hundred types of yarns, many of them new synthetics, the textile industry is turning to the computer to mix and match colors for today's fashions and fabrics.

While a color may be Yale Blue to the human eye, to the computer it's a 48 digit number. Taking that color code, the computer can match it and automatically print out formulas and dye costs to reproduce it.

Matching a color by eye required a painstaking sort through hundreds of colors from previous dyeings to find the right one, test producing the new color in the laboratory, then enlarging the formula from test-tube propotions to a vat large enough to dye a ton of yarn at a time.

Two different types of IBM computers are being used for color matching: the desk sized 1130 computing system and the 1800 data acquisition and control system.

It matches the sample color with a variety of formulas, (one firm produced up to 1200 formulas for a single color.)

It indicates how the color match will appear under different lighting. Some colors change, for example, when viewed in fluorescent light as compared to daylight, so that matching fashions no longer match under different lights.

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CURRENT OPPORTUNITIES Systems Formulation
Several intermediate and senior positions are available. Will develop functional specifications for advanced state-of-the-art equipment emphasizing digital communication, multi-processing, multi-programming and time sharing as applied to large commercial computers. Requires degree and in-depth related experience.

System Specialist
Will do original design and development in complex operating system for large scale multi-computer systems and will coordinate the efforts of programmers in relation to over-all project completion. Degree and related experience in software development and programming required.

Systems Analysts
Responsibilities will include systems analysis in manufacturing, financial and administrative areas. Will work closely with programming group in installing new systems. One year's systems analysis experience required.

Software Programmers
Will develop software for various input/output routines. Prefer college-trained applicants with previous machine language or large file computer programming experience.

ARRANGE NOW FOR SJCC INTERVIEW
To arrange a confidential interview at the Spring Joint Computer Conference in Atlantic City, April 30-May 2, contact the NCR representative at the Claridge Hotel, telephone (609) 345-1281. If you do not plan to attend SJCC, please submit resume to BILL McNAMEE.

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'Manage' System Ends Need to Store and Update Source Decks

DALLAS – A computer installation can maintain its source programs on tape or disk by using a new software product called Manage. Programs written in Cobol, Fortran, Autocoder, ACL, and other languages can be maintained. The expense of storing and modifying programs on punched cards is thus wiped out.

The system insures program security, the designers, Mathematical Engineering Associates (MEA), said. Time and sequence of any use, listing, or modification of programs on the master file is also listed on a computer console log. This process takes place each time the user accesses a program.

An installation carries its source language programs on the master tape or disk. Programmers then use their computer to re-sequence and maintain programs. In addition to these modifications, the master tape or disk might be used for input, output, and program listings.

Documentation Improved

Unlike older ways of listing programs from source decks, a program log produced by Manage becomes a part of program documentation. Exact modifications in each update run are shown by the log. This lets a manager or programmer see what modifications have been made and when they have been made. Much confusion is eliminated because there is only one listing, and one history log, for each program, MEA said.

Available for the IBM 360 series, Manage is already operational on the 1401. And, this new software product can be furnished for virtually any machine that supports Cobol, MEA president Robert L. McIntire told COMPUTERWORLD. The program can be run using tapes or disks alone, with input or printout being done off-line. A card reader, printer, console typewriter, and tape or disk capability are usual in the configuration of a computer using Manage.

Reduces Errors

Manage does not maintain object programs usually carried on-line when a computer is in operation. Instead of object programs being patched, source programs are maintained and the log is kept. A source program and its object program cannot inadvertently be altered from information carried on an obsolete or inaccurate listing, according to MEA.

MEA charges $2485 to install Manage "for use in one computer facility," not counting travel expenses for the consultant who does the installing. Customers provide the computer time to check out the program on their own hardware. Any future revisions of Manage will be sent to each purchaser at no charge, McIntire said. Other future support is to be billed to the individual customer at regular MEA rates.

MEA is at 7007 Preston Rd. here.

COMPUTERWORLD **software**

Evaluator Revised

PORT CHESTER, N.Y. – A revised version of the outputs of Worldwide Computer Services, Inc. 360 Evaluator Program (See CW, Feb. 28, p. 3) was shown this week to COMPUTERWORLD by Jerald Greenberg.

The output format has been changed to make the results clearer. The WCS Evaluator Program simulates the operations of a 360 Communications system with messages passing through. As a result, it is able to show the loadings on various peripherals, and the effect on response time a user can expect in particular situations.

In the samples shown alongside, for instance, the effect of a 40% line loading on a 360/40 communications system can be seen as tested over a three minute period. This demonstrates what response time can be expected and what significant variation is possible. In this particular sample – the units are in milliseconds – the response time is just over one minute with a 15 second standard deviation.

To Prevent Overengineering

The idea of the evaluator program is to prevent systems being overengineered, and to locate those parts which are underutilized. A company could try this system with their message loads with one or two 2311s. The effect of different numbers of telephone lines could be considered.

Use Sets Inputs

The user provides the detail to be considered by means of a hardware definition, and a statement as to the number and type of messages. These are printed out on the five part report ahead of the evaluations forming a record of the problem that was solved.

2. DEVICES

1. 2311'S

DEVICE NAME	AVG USE	AVG TIME/USE	NO OF OPER	MAX REQ'S WAIT	AVG WAIT TIME
DKF11	.143	116.689	222	4	24.162
DKF12	.140	113.648	222	3	17.072

These two printout sections illustrate some of the output from the WCS evaluator program. The upper printout shows that the 34 messages had an average response time of just over a minute, that there were at most only two messages waiting on the IBM-2311 while there were up to 13 messages waiting to be processed by the F1/P1 routines.

The lower printout shows the effect of the messages on the utilization of the peripherals – in this case two of the IBM 2311s. This shows that the WCS evaluator has calculated that the average wait time on neither of them exceeded 25 msec – well under the length of time the devices were in actual use.

*** W C S E V A L U A T O R R E P O R T ***

PREPARED FOR COMPANY ABC

DATE - 3/23/68 SIMULATION TIME - HRS 3 MIN SEC

*** P E R F O R M A N C E E V A L U A T O R S ***

RESPONSE TIME DISTRIBUTION. THE BASIC UNIT OF TIME IS A MS

NO OF MSGS	MEAN TIME/MS/	STD DEVIATION
34	64761.117	15168.000

LIST PROCESSING STATISTICS - AS PROCESSED BY F1/P1

NO OF ENTRIES	MAX NO ON LIST	CURRENT NO	AVG TIME/ENTRY
1324	13		130.274

STATISTICS ON QUEUE OF MSGS ON 2311 TO BE PROCESSED BY P2/F2

NO OF ENTRIES	MAX NO ON LIST	CURRENT NO	AVG TIME/ENTRY
20	2		240.799

INPUT LINE SERVICE STATISTICS- WAIT PERIOD UNTIL XMISSION STARTS

NO OF ENTRIES	MAX NO ON LIST	CURRENT NO	AVG TIME/ENTRY
41	1		14.951

SOFTWARE FOR SALE

MAILING LIST MAINTENANCE

Set of programs for setting-up, adding to, deleting from, revising, or correcting a mailing list. Up to ten types of classification data can be used with each name. Record formats handle most types of membership lists, customer lists, etc. Labeling printers included.

Run on 360/30, 4 tapes, 32K
Price: Upon request
Contact: Mr. William McMillan
CF Industries
225 East Street
Winchester, Mass.

Optimum Cutting and Inventory Adjustment Program

Program used a modified transportation technique to develop a cutting list which selects pieces from a given inventory for cutting (in one dimension only) to required sizes, with minimum scrap. It also calculates the material usage and scrap generated, updates the remaining inventory, and prints out updated inventory ledger sheets. Implemented on IBM 1410 with 10K, four tapes.
Price: Upon Request
Contact: Mr. Lionel Ruberg
205 W. Franklin St.
Richmond, Va. 23220

COBOL-AID

A cross reference aid for System/360 programs. For use with individual or multiple program. COBOL-AID analyzes the Procedure Division of COBOL source programs. Every data name, literal and library name is cross-referenced by page and line number. Package includes 3 COBOL source programs and 2 IBM DOS sort programs with job control.
Price: $350
Contact: Computer Results Corp.
1680 Riverdale Rd.
W. Springfield, Mass.

DISK OPERATING SYSTEM

This system provides a disk resident SORT program, with disk residence for as many as 200 programs on a single disk pack, and the supporting programs for any desired maintenance which may be required.
Implemented on IBM 1440, 8K, 1 1311 drive, index registers.
Price: Upon Request
Contact: Paul B. Boudreau
34 Cottage Street
Leominster, Mass.

GIANT - General Information and ANalysis Tool

Specially designed for planning activities is now available to you. This system is being utilized today by marketing planners and economists. For further information:

Price: Upon Request
Contact: B. Rasmussen
R. Shriver Assoc.
Denville Professional Bldg.
Denville, N.J. 07834

360/20 Documentation Aid

Program is designed to list and analyze Model 20 commercial applications. For each procedure it lists fourteen events, and analyzes seven of them. Some of the topics covered are: application category, program type, core use, run time, report distribution, and multi-procedure use. Implemented for 360/20 8K, written in RPG.
Price: Upon Request
Contact: Edward W. Helgesen
Pepsi-Cola General Bottlers, Inc.
1745 North Kolmar Avenue
Chicago, Ill. 60639

PAYROLL SYSTEM

Series of 6 programs which compute payroll on a modular basis. Handles multi-companies. Contains tabulation analysis for labor distribution. Will handle most payrolls. Runs on IBM 360 - Mod 30 16K Disk - BAL - Price: $3000

Contact: Mr. William McMillan
CF Industries
225 East Street
Winchester, Massachusetts
(617) 729-4650

CLASS SCHEDULING

Program sets up master course schedules based on course requests from instructors, edits the master schedule and course requests for errors, schedules students into proper courses, prints out course schedules for each student and prints out course rosters and punches out cards for grade reporting, etc.
Implemented on Burroughs 5500.
Price: Upon Request
Contact: Ralph L. Morley
1511 Crenshaw Blvd.
Torrance, Calif. 90501

Autocoder to 360 DOS-BAL

Program converts 1401 Autocoder source statements into IBM 360 DOS-BAL source statements. It is about 97% effective on typical 1401 tape programs.
Implemented for 360 with 32K or larger. Written in DOS-BAL.
Price: Upon Request
Contact: Karl A. Fugal
1536 East 1220 North
Logan, Utah 84321

PAY RATE CALCULATIONS

Program calculates 24 and 26 pay period amounts and hourly rates for annual salaries between $3000 and $16,000 at $10 intervals. (Can be adjusted to other range or intervals). Implemented for IBM 1401, 4K storage. Price: Upon Request.
Contact: William Cornwell
102 St. Johns Road
Shiremanstown, Penna. 17091

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Send COMPUTERWORLD your listing . . . we'll send you the customers.

Avco Reprograms Its Computer Services

WILMINGTON, MASS. – In a re-shuffle of the Avco Missile Systems Division here the old Management Systems and Information Sciences area got a new title – and a new goal. Now called Avco Computer Services, its function was officially changed to make the provision of computer services a company product just as much as re-entry vehicles.

The new area, headed by Dr William Brown, has ordered a 360/85 to supplement its current computer power (their computer room already looks like it has a complete set of 360s, running from the 75 down to the 20 and with everything in between). Its aims are to sell raw computer time, packaged services including software, and ancilliary services.

"We Want To Change Our Image"

Talking to COMPUTERWORLD the day the announcement was made, Brown said that they were trying to change their image. "Our competitors sometimes refer to us 'dumping' computer time," he said. "I don't think that we ever did. But if we did that is all in the past. We are in a competitive market, both inside this company and outside, and we are going to stay on top."

Asked how they intended to stay there, Brown explained the basic ideas were to wed the economies of very large systems with the economies of using very good people. "I call it the Economics of Quality," he said. "We can get more multiplications to the dollar with the large system and more usefulness to the dollar from the highly skilled professional. And we are getting them. We will provide tools for decision making. That's our function. And we will support our customers, help them to get the best out of our services."

Asked about what the support will consist of, and why it was needed, he said,

Dr William Brown

"When a new piece of software comes in – or a new system – someone has got to study it. While it is running, someone has got to remain familiar with it, explain how to run it to customers and to help them with it. Someone has got to find out what parts of programs have to be rewritten because programs change all the time. We've received many, many programs from outside sources, and we always have to dedicate people to learning them before we can get real use out of them. It's just the way things are. Here in Avco Computer Services we think that we can do this for our customers more economically than our competitors. And we are going to do it for them."

Now 50% of Time Is Sold

Currently about 50% of the time in the computer area is being sold against competition, up from 40% about a year ago. Stone & Webster, a large engineering firm in Boston, is one of the big clients. It uses the Avco Models 65 and 75 for running programs two to two and a half shifts a day. Currently Stone & Webster engineers simply dump programs into their own Model 20 for transmission to the Avco 20. The programming for both ends was done by Avco, and the operation has expanded from the single shift which Stone & Webster expected to more than double that.

Avco system people are now running special courses on ways of using the Job Control Language, as a part of the support program.

COMPUTERWORLD **trade news**

Informatics Creates Mark IV Field Staff

SHERMAN OAKS, CALIF. – A software firm has appointed a field staff to provide service and support to users. Continuous maintenance, including at least one visit by a system engineer every month, is guaranteed to users of the Mark IV File Management System by Informatics Inc.

Three days of training will be given to programmers and systems people. Various manuals will be distributed from offices in Chicago, Washington, and New York. And an organization called Ivy League will afford users the opportunity to meet and exchange ideas.

The Mark IV is an advanced general purpose software product for use with the IBM 360.

Support Available

The field staff that services the Mark IV will also function as a sales staff. The systems engineering that is provided will be similar to that of IBM, according to F. Joseph Biederman, Informatics marketing representative in New York. When a user seeks advice or feels that the system is not working as it should, he will have unlimited use of a system engineer by telephone in addition to the monthly visits, Biederman told COMPUTERWORLD.

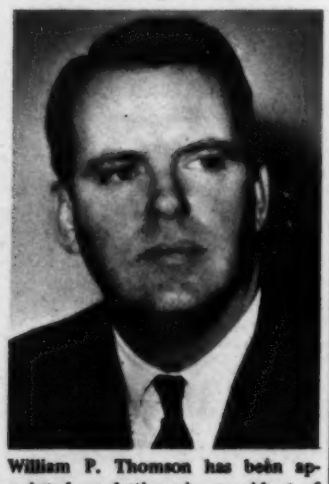
Documentation Provided

Documentation will include reference, operation, user, and technical manuals. The users' organization is similar to Guide or Share. An Ivy League meeting in Los Angeles in January was attended by nearly 100 persons, he said.

Mark IV, developed by the Advanced Information Systems Division of Informatics, can be used in a wide range of data handling applications in business and government. It is marketed and supported as a proprietary product with a complete field support program. Over 100 systems are scheduled for installation.

Service and support in the Midwest will be supplied from the Chicago office by Stanley R. Felderman, marketing representative, and Wayman E. Hancock, system engineer. In the East, David A. Levine, marketing, and James R. Doyle, systems, will work out of the Washington, D.C. office. The New York office will be staffed by Biederman and Mark W. Bonham, systems.

Named Keydata VP



William P. Thomson has been appointed marketing vice president of Keydata Corp., Cambridge, Mass. Thomson formerly held marketing and sales positions with the Service Bureau Corp.

Univac to Expand Bristol Plant

BRISTOL, TENN. – Univac will double the size of its plant here, enabling it to manufacture plated-wire memories and additional rotating memory devices.

The expansion will include 150,000 square feet of manufacturing space and a multi-story, 40,000 square foot office building. Another 25,000 square feet of manufacturing space will be freed by moving all offices to the new building, Univac announced.

The current work force of 1100 will be expanded as the new plant space becomes available later this year and next year.

The plant produces a number of devices for the Navy as well as a variety of commercial products.

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Atlanta, Ga. 30329
404-633-2579

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201-721-8918 - Mr. Kazimir

FOR SALE: Complete System – 1401 Model F3, 4K, incl. 1402 Model 1 card read-punch; 1403 Model 2, 600LPM printer; 1405 Model 1, 20,000,000 char. disc storage; 1407 Model 1 typewriter console. System under IBM maintenance contract. Available 8-1-68; $65,000; w/o printer $55,000. Details upon request. Contact W.H. Ballantyne, Bankers Security Life Ins. Society, 1701 Pa. Ave., N.W., Washington, D.C. 20006; (202) 298-6225.

COMPUTER TIME AVAILABLE
Communication Based 360/20 2nd and 3rd Shifts. Los Angeles, Chicago, Orlando, Reading, Pa. Reasonable price beginning July 1. 12 K, 2 9T Tapes, 2501 Card Reader, 1442 Punch, 1403 N1 Printer, 2311 Disk. Configuration can be altered. Communication ready with adapter and 201A dial up data set. Proven software furnished. 360/65
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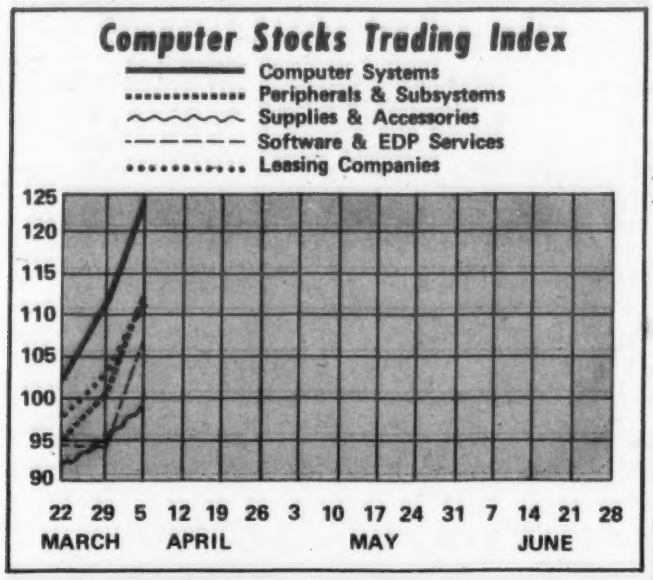

Computer Issues Move Up Sharply

(continued from page 1)

Stocks of computer manufacturers fared will, with the sector index increasing 10.9% to 124.12. Scientific Data Systems which issued its flashy annual report last week was the biggest gainer, moving up 22% to 154-1/2. Others showing strong upward moves of more than 10% were Scientific Controls, up 18%; Digital Equipment, up 14%; Systems Engineering Labs, up 12%. The only stock to lose ground in this sector was Hewlett-Packard, which declined .85 to 73.

Stocks in the Peripherals and Subsystems sector also made strong gains. Digitronics, after losing ground the previous week, was up 22% to 21. The company is acquiring Dialight, a manufacturer of indicator lights for electronic control equipment.

Electronic Memories moved up 19% to 41-1/2. Other stocks gaining at least 10% included Mohawk Data Sciences which was up 14% on a prediction by a company executive that third quarter earnings would exceed those of the second quarter, and that fiscal 1968 billings would be more than double those of a year earlier; Alphanumeric continued its spectacular gain made the previous week and moved up another 14%, Data Products was also up 14%, Gerber Scientific was up 13%, Potter Instrument and Recognition Equipment were both up 12%. Bunker-Ramo moved down 6% to 12-3/8 in the second sharpest loss among computer stocks. The company is seeking to acquire Amphenol, a manufacturer of electronic accessory equipment.

The Supplies and Accessories sector continued to be the weakest with its index remaining below 100 and with 6 out of 14 stocks posting losses last week. Standard Register was down 9% to 26-1/4 – the biggest loss of any computer stock last week. Reynolds & Reynolds and Walace Business Forms were both down about 2% while Adams-Millis, Ennis Business Forms, and Wabash Magnetics each suffered losses of less than 1%. Memorex posted the largest gain in the sector and was up 12% to 55-1/4.

Some of the biggest gains on the table were registered by stocks in the Software and EDP Services sector. Four stocks gained more than 20%. Brandon Applied Systems was up 29% to 9, recovering some of its recent losses. Computer Network and Digitek were both up 27%, and University Computing was up 22% to 78. Seven other stocks in the sector moved up 10% or more, 2 moved up less than 10%, 2 remained even (TBS Computing Centers and Software Systems), and 2 lost ground – Computer Usage was down 2% to 43-1/2 and Planning Research was off .36%.

Dearborn Computer showed the largest percentage gain among computer stocks. It was up 31% to 24. Other stocks in the leasing sector did well. Gains of 27% were shown by both Computer Leasing and Data Processing Financial & General. Leasco gained 15%; U.S. Leasing, 11%. All other stocks in the sector made gains of 10% or less, except for Management Assistance, which was down 5% to 10-1/2. Computer leasing firms have been benefiting from a sharp upswing of buying interest as firms in the sector diversify their operations.

Financial Items

NEW YORK – John Randolph, chairman and president of Randolph Computer, told security analysts here that the leasing industry has the capacity to double in 1968 the volume of $500 million in equipment added and financed last year.

Randolph began 1967 with $29.3 million of computer equipment on lease and increased the total to $74 million at year end. During the first quarter of this year the company expects to add $14 to $15 million in equipment, which would make the period the best in the company's history.

"While New York City banks may be relatively tight, the county banks seem to have money they want to lend," Randolph reports.

The company has $57 million available in firm, contractual agreements covering the next 18 months, compared with $33 million at the end of 1967, according to Randolph.

COMPUTER STOCKS: TRADING SUMMARY

Week Ending April 5, 1968

EXCHANGE	BASE PRICE 3-1-68	WEEK AGO CLOSING PRICE	CLOSING PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	177 3/8	194 1/4	• Burroughs	+ 16 7/8	+ 9.51	+ 18.90
NYSE	67 3/4	77 1/2	78	Collins Radio	+ 1/2	+ 0.65	+ 15.13
NYSE	101 1/2	128 5/8	139 1/4	• Control Data	+ 10 5/8	+ 8.26	+ 37.19
AMSE	102	116 3/4	132 5/8	• Digital Equipment	+ 15 7/8	+ 13.60	+ 30.02
NYSE	87 1/4	86 3/8	89 1/4	General Electric	+ 2 7/8	+ 3.33	+ 2.29
NYSE	60	73 5/8	73	Hewlett-Packard	– 5/8	– 0.85	+ 21.67
NYSE	93 1/8	107 7/8	155 3/8	• Honeywell	+ 7 1/2	+ 6.95	+ 23.89
NYSE	577	612 1/2	630	• IBM	+ 17 1/2	+ 2.86	+ 9.19
NYSE	103 7/8	115	124 1/2	• Nat Cash Register	+ 9 1/2	+ 8.26	+ 19.86
NYSE	78 1/4	46 3/8	50 1/8	RCA	+ 3 3/4	+ 8.09	+ 6.93
NYSE	46 7/8	82 3/4	87	Raythson	+ 4 1/4	+ 5.14	+ 11.18
+OTC	22 1/2	26 3/4	31 1/2	• Scientific Controls Corp.	+ 4 3/4	+ 17.76	+ 40.00
NYSE	118 1/8	127	154 1/2	• Scientific Data	+ 27 1/2	+ 21.65	+ 30.79
NYSE	45	48 1/8	52 1/8	• Sperry Rand	+ 4	+ 8.31	+ 15.83
*OTC	45	23 1/4	26	• Systems Engineering Labs.	+ 2 3/4	+ 11.83	+ 15.56

EXCHANGE	BASE PRICE 3-1-68	WEEK AGO CLOSING PRICE	CLOSING PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	58 3/8	55 3/8	60 1/2	Addressograph-Multigraph	+ 5 1/8	+ 9.26	+ 3.64
OTC	64	79	90	Alphanumeric	+ 11	+ 13.92	+ 40.63
NYSE	29	28 7/8	31 1/4	Ampex	+ 2 3/8	+ 8.23	+ 7.76
OTC	17 1/4	18 1/4	20	Bolt Beranek & Newman, Inc.	+ 1 3/4	+ 9.59	+ 15.94
AMSE	13 1/2	13 1/8	12 3/8	Bunker-Ramo	– 3/4	– 5.71	– 8.33
AMSE	32 1/8	37 1/4	38 1/2	• Calcomp	+ 1 1/4	+ 3.36	+ 19.84
OTC	15 1/4	14 3/4	16 3/4	• Data Products	+ 2	+ 13.56	+ 9.84
OTC	19 1/4	17 1/4	21	• Digitronics	+ 3 3/4	+ 21.74	+ 9.09
OTC	39	35	41 1/2	• Electronic Memories	+ 6 1/2	+ 18.57	+ 6.41
OTC	10	9	9 1/2	• Fabri-Tek	+ 1/2	+ 5.55	– 5.00
OTC	34	39	44	Gerber Scientific	+ 5	+ 12.82	+ 29.41
AMSE	16 7/8	17 1/2	17 3/8	Milgo Electronics	– 1/8	– 0.71	+ 2.96
AMSE	115 1/8	137 1/4	156 1/2	• Mohawk Data Sciences	+ 19 1/4	+ 14.03	+ 35.94
OTC	74	86	90	• Optical Scanning Corp.	+ 4	+ 4.65	+ 21.62
OTC	72	77 1/2	83 1/2	Photon	+ 6	+ 7.74	+ 15.97
AMSE	25 5/8	23 3/4	26 5/8	• Potter Instrument	+ 2 7/8	+ 12.11	+ 3.90
OTC	40 1/4	44 1/2	49 3/4	• Recognition Equipment Corp.	+ 5 1/4	+ 11.80	+ 23.60
AMSE	16	16 1/2	15 3/8	Rixon Electronics	– 1 1/8	– 6.82	– 3.91
NYSE	46 1/8	43	47 1/8	Sanders	+ 4 1/8	+ 9.59	+ 2.17
OTC	40 1/2	38 1/2	40	• Tally Corp	+ 1 1/2	+ 3.90	– 1.23
NYSE	242 1/4	241 3/4	263	Xerox	+ 21 1/4	+ 8.79	+ 8.57

EXCHANGE	BASE PRICE 3-1-68	WEEK AGO CLOSING PRICE	CLOSING PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	48 1/2	44 1/2	46	• Acme Visible	+ 1 1/2	+ 3.37	– 5.15
NYSE	41	46 1/2	46 1/4	Adams-Millis	– 1/4	– 0.54	+ 12.80
OTC	13 5/8	12 3/4	13 3/8	• Baltimore Business Forms	+ 5/8	+ 4.90	– 1.83
AMSE	27	27 1/2	29 3/8	• Barry Wright	+ 1 7/8	+ 6.82	+ 8.80
OTC	27 1/4	28 1/4	28	• Ennis Business Forms	– 1/4		+ 2.75
NYSE	84 1/8	86 1/2	89 3/4	• 3M Company	+ 3 3/4	– 0.88	+ 6.69
OTC	58	49 1/4	55 1/4	• Memorex	+ 6	+ 3.76	– 4.74
TOR	27 1/4	27 1/4	29 1/4	• Moore Business Forms	+ 2	+ 12.18	+ 7.34
NYSE	57 1/4	56 3/4	60 3/4	Nashua Corp.	+ 4	+ 7.34	+ 6.11
OTC	31 1/4	31	30 1/2	Reynolds & Reynolds	– 1/2	+ 7.05	– 2.40
OTC	34 1/2	29	26 1/4	• Standard Register	– 2 3/4	– 1.61	– 23.91
NYSE	37 3/4	33	34 3/4	• Uarco	+ 1 3/4	– 9.48	– 7.95
AMSE	14 1/4	14 3/8	14 1/4	Wabash Magnetics	– 1/8	+ 5.30	– –
OTC	25 3/4	26	25 1/2	• Wallace Business Forms	– 1/2	– 0.87	– 0.97
						– 1.92	

EXCHANGE	BASE PRICE 3-1-68	WEEK AGO CLOSING PRICE	CLOSING PRICE	SOFTWARE & EDP SERVICES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	17	15	16 1/2	• Applied Data Research	+ 1 1/2	+ 10.00	– 2.94
OTC	15 1/2	18 1/2	20 1/2	• Aries	+ 2	+ 10.81	+ 32.26
AMSE	47	48	51 7/8	Automatic Data Processing	+ 3 7/8	+ 8.07	+ 10.37
OTC	9	7	9	• Brandon Applied Systems	+ 2	+ 28.57	– –
AMSE	22 7/8	23	27 1/8	Computer Applications	+ 4 1/8	+ 17.93	+ 18.58
OTC	30	26	33	Computer Network	+ 7	+ 26.92	+ 10.00
AMSE	40	36	42 5/8	• Computer Sciences	+ 6 5/8	+ 18.40	+ 6.56
OTC	39	44 1/2	43 1/2	• Computer Usage	– 1	– 2.25	+ 11.54
OTC	36 1/2	39 1/2	45 1/4	• Computing and Software	+ 6	+ 14.56	+ 23.97
OTC	12 1/2	8 1/2	10 3/4	• Digitek	+ 2 1/4	+ 26.47	– 14.00
AMSE	38 3/8	31 1/4	36 7/8	Electronic Computer Prog. Inst.	+ 5 5/8	+ 18.00	– 14.00
OTC	35	35 1/2	40 1/2	• Informatics	+ 5	+ 14.08	– 3.91
OTC	11 1/2	9 1/4	9 1/2	• National Computer Anal./sts	+ 1/4	+ 2.70	+ 15.71
AMSE	31	34 3/8	34 1/4	Planning Research	– 1/8	– 0.36	– 17.39
OTC	9	8	8	Software Systems	– –	– –	+ 10.48
OTC	20 1/2	19	19	TBS Computing Centers, Inc.	– –	– –	– 11.11
OTC	63	64	78	• University Computing	+ 14	+ 21.88	– 7.32
							+ 23.81

EXCHANGE	BASE PRICE 3-1-68	WEEK AGO CLOSING PRICE	CLOSING PRICE	LEASING COMPANIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	19 1/4	20 1/8	21 1/2	Chandler Leasing	+ 1 3/8	+ 6.83	+ 11.69
AMSE	25 1/8	22 1/8	28 1/8	• Computer Leasing	+ 6	+ 27.12	+ 11.94
OTC	12 1/4	12 1/4	118	• Cyber-Tronics	+ 1/4	+ 2.04	+ 2.04
AMSE	106 5/8	101	13	• Data Proc. Financial & General	+ 17	+ 9.47	+ 4.00
OTC	12 1/2	11 7/8	24	Datronic Rental	+ 1 1/8	+ 27.27	+ 10.67
OTC	20	18 1/4	14 1/4	Dearborn Computer	+ 5 3/4	+ 31.51	+ 20.00
OTC	13 1/4	13 1/4	34 1/8	• DPA, Inc.	+ 1	+ 7.55	+ 7.55
AMSE	28 3/4	32 1/8	116 3/4	• GC Computer Corp.	+ 2	+ 6.23	+ 18.70
AMSE	98	101 3/4	59 3/4	• Leasco	+ 15	+ 14.47	+ 19.13
AMSE	45 7/8	58	10	• Levin-Townsend Computer Corp.	+ 1 3/4	+ 3.02	+ 30.24
OTC	10 1/2	9 3/4	10 1/2	• LMC Data, Inc.	+ 1/4	+ 2.56	– 4.76
OTC	10 7/8	11	46	• Management Assistance	– 1/2	– 4.55	– 3.45
AMSE	38	41 7/8	11 1/2	• Randolph Computer Corp.	+ 4 1/8	+ 9.85	+ 21.05
AMSE	10 7/8	10 3/8		U.S. Leasing	+ 1 1/8	+ 10.84	+ 5.75

*Companies included in Computerworld's stock trading index for each sector.

Wall Street's View

CDC, SDS Prices Seen Rising to 200

AUTOMATIC DATA PROCESSING – First Hanover Corp. believes the stock has begun to develop a new base in the mid 40's and will rise up to and beyond the high of 70 which the stock attained before the sell-off early this year.

CONTROL DATA – Bache & Co. recommends purchase for those accounts willing and able to assume above average risk, noting that the company's earnings will depend on its ability to turn both Electronic Associates, a planned acquisition, and CEIR, an earlier acquisition into more profitable operations. It suggests positions be maintained while waiting for reactions or a period of consolidation in the 142-145 area. First Hanover Corp. sees CDA stock at one of its most advantageous buying points in many months and foresees further strength developing which could take the stock back up through the 160's and toward a longer term objective of 200. Phillips, Appel & Walden feels the stock is meeting quite a lot of supply at current levels and suggests buyers keep posted closely.

NCR – Bache & Co. recommends a program of accumulation for NCR's shares which are priced at the lowest P/E multiple of any of the major office equipment manufacturers holding an important position in computers.

RANDOLPH COMPUTER – Hayden, Stone, Inc. notes that the stock's base has strengthened and expects a recovery close to 50. Gude, Winmill & Co. thinks the stock should move sharply higher and advises purchase.

SCAN-DATA – Winslow, Colu & Stetson, Inc. feels the stock offers an unusually good opportunity for long term capital gains along with at least some of the risks associated with an embryonic business. It suggests that the hazards associated with the very small amount of stock in the active trading pool should be kept in mind by potential investors.

SCIENTIFIC DATA SYSTEMS – First Hanover Corp. notes that any new upsweep is expected to return the price of SDS stock to its old high of 152 reached in December of last year, and to a longer term target of approximately 200.

New Literature

Techniques Explained

Electronic Digital Techniques, Dr Paul M. Kintner. McGraw-Hill. 310 pp. plus index. $11.95.

Electronic Digital Techniques provides a comprehensive introduction to the subject from the technical and practical viewpoint of the engineer interested in acquiring improved design skills. Avoids highly specialized language of the digital computer and logic theory text and explains all concepts as completely as possible without recourse to algebra or other mathematical formulations. Covers recent advances including integrated circuits as applied to digital switching circuits. Chapters on system sequencing and rate multiplication, intensive coverage of flip-flops, pulse generators and counters.

Author Kintner is manager, digital systems and products development, industrial systems division, Cutler-Hammer, Inc. He has specialized in the field of application of digital techniques to industrial control and instrumentation.

Computer Industries, Inc. Reference Catalog. 12 pp. Free. Order from Graphic Systems Division, Computer Industries, Inc., 14761 Califa St., Van Nuys, Calif. 91401.

Catalog is a brief review of the Graphics Systems Division of Computer Industries' computer peripheral hardware product line. A four page catalog is also available. The division manufactures strip-chart, film, and large-area digitizing systems; incremental plotting systems; high speed, high accuracy drafting systems; flatbed D/A plotting systems; and cathode ray tube microfilm printers plotters. Computer Industries is the manufacturing subsidiary of University Computing Co.

Chemist – The Rand Chemical Equilibrium Program, AD-664 045. E.C. Deland. 141 pp. $3.00. Order from the Clearinghouse, U.S. Dept. of Commerce, Springfield, Va. 22151.

A manual for the use of Chemist, a computer program for the simulation of complex chemical equilibria, prepared by the Rand Corp. Chemist has been used to make mathematical models of simple chemical systems, organic systems, viable biological systems, and inorganic systems at non-standard pressures and temperatures. Program can meet varied requirements, but is applicable only to computation of chemical equilibria, and not directly to study of chemical kinetics.

Chemist is written in natural language for easy use by professionals untrained in programming. The program is still in a state of development, and the manual will be modified periodically.

Two Conversational Languages for Control-Theoretical Computations in the Time-Sharing Mode, AD-664 221. P.M. Newbold and A.K. Agrawala, 53 pp. $3.00. Order from the Clearinghouse, U.S. Dept. of Commerce, Springfield, Va. 22151.

Users' manuals of two conversational languages for use on a direct access, time sharing computer. First language is a matrix manipulation language; second is designed to stimulate linear dynamic systems and to solve the associated Riccati equations. Written for the Joint Services Electronics Program and NASA, November, 1967.

Anhysteretic Magnetization and Flux Reversal in Tape Cores, and an Analog Core Memory, AD-664 233. F.J. Friedlaender and J.D. McMillen. 96 pp. $3.00. Order from the Clearinghouse, U.S. Dept. of Commerce, Springfield, Va. 22151.

Investigates the low speed switching mechanism for 50% nickel-iron tape cores. Anhysteretic magnetization curves are obtained and related to core geometry. Report includes a general summary of switching models for all ranges of switching, and description of an analog memory device. Written for the Joint Services Electronics Program and National Science Foundation, December, 1967

System Overlap OKd By Firm's Treasurer

NEW YORK – "You should get the treasurer on your side if you want a six month overlap!" This was the main point that J.G. McGuire made when talking to COMPUTERWORLD this week. McGuire, data processing manager of C. Tennant Sons & Co. is in an unusual situation because he has managed to get his firm to pay for two EDP systems for six months while one is phasing into the other. He has a NCR 390 system using magnetic ledger cards in one room at 100 Park Avenue. In the next room, built especially for the installation, he has a 360/20 card machine which came in last December. This uses an MFCM. Tennant hopes to save up to $17,000 a year using the 360/20 to replace the NCR. However, they are now working side by side.

McGuire is in no rush to move out the NCR system. He wants to make certain things go smoothly. He told COMPUTERWORLD that "moving from the NCR 300 to the 390 we got some extra help, tried to do it without overlap, and then had six to eight months of headaches. I am not going through that again. I feel that you can't change over a complete system like that. You may be able to add peripherals but not a system!"

The recent system change was needed as Tennant's volume increased. The firm felt that the billing system was not up to what they wanted it to do, and that they really wanted to move out of the use of magnetic ledger cards. They had found that the equipment needed to create the original input was much more expensive with the ledger card system than it was with the punch card system. "It only costs us $100 to have a key punch, as compared to $350 while we were using the magnetic ledger cards. When we take this into account, it means that the IBM 360/20 is cheaper for us than the NCR 390."

Some things, however, are going to be a little bit more expensive in the future. While with the 390 Tennant did not have a programmer, now they have a girl at RPG school and an outside programmer on the staff. They are using RPG for most of their applications so they can move more easily when the time comes. Asked how it happened that the financial people had approved the unusually long change-over system, McGuire said, "They were in on it from the start. Our treasurer, Mr Eric Hunt, is an old DP man himself – and he knows what it [the changeover] means."

EDPeople

Fremming to Head UCC Division

Michael D. Fremming has been promoted to the newly created position of president of *University Computing Co.'s* education division, the Academy of Computer Technology. Fremming, who holds a doctorate in education, has been with UCC almost from the company's inception.

Robert O. Rupprecht has been named manager, corporate operations analysis for *Burroughs.* He succeeds **Eugene F. Smith** who has been appointed assistant group controller, defense, space, and special systems group.

Richard L. Beattie has been named to the new position of director of information systems and services at *Rockwell Manufacturing Co.* He has been director of corporate systems and data processing since he joined the company in 1966.

Gordon G. Cochrane has been appointed to the newly created position of manager of computer programming and operations at the *R.T. French Co.*, Rochester, N.Y. He was previously assistant manager of systems and programming. A member of the Computer Systems Association of Rochester, Cochrane joined French's in 1966 as a senior programmer.

R. A. Pope

Richard A. Pope has been promoted to assistant vice president (EDP) of the *Federal Intermediate Credit Bank* and the *Federal Land Bank of Columbia, S.C.* Pope will assist vice president James E. Wilson in directing the electronic data processing operation for the two banks.

Judson Bemis has been elected to the board of directors of *Control Data Corp.* He is president of Bemis Co., Inc.

Col. Henry J. Mazur has been appointed system program director of the space defense/command system program office at the *Air Force Electronics Systems Division,* Hanscom Field, Mass. Col. Mazur came to Hanscom Field in 1965 and has served as deputy base commander, system program director, and division chief of the command and control management system deputate.

Robert L. Casselberry has been named manager of marketing for the communication products department of *General Electric.* He will head all functions involved in the development of both new and existing markets for information network systems, data communications, and power line carrier current equipment. Casselberry is nationally known in the field of communications, and has made numerous appearances before the Federal Communications Commission in support of radio spectrum reallocation.

Donald S. Schofield has been promoted to vice president and treasurer of *Wolf Research and Development Corp.*, West Concord, Mass. He will be responsible for corporate management and financial affairs, including fiscal analysis of potential merger candidates to "round out" the technological range of Wolf's software capabilities.

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LOS ANGELES – Computer Sciences Corporation (CSC) has formed a new organization known as Computer Sciences Institute. The Institute will serve industry, government, the military, and the public education markets through the development of complete education systems and by

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*To get this news in focus, COMPUTERWORLD chased Institute officials all over the country. After missing them at the New Orleans airport, they were found both in New York and Los Angeles. The phrase "Structured Learning" was investigat[ed] was their experience and results. W[hen] th[e] news was printed for YOU it was U[p] B[y]